

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

21 1. (original) A planar electron emitter device, the planar electron emitter device comprising:

an emitter electrode;

an extractor electrode; and

a solid-state field controlled electron emitter having a Schottky metal-semiconductor junction fabricated on the emitter electrode and electrically coupled to the extractor electrode such that an electric potential placed between the emitter electrode and the extractor electrode results in field emission of electrons from an exposed surface of the Schottky metal-semiconductor junction, wherein the semiconductor layer of the Schottky metal-semiconductor junction includes an outer perimeter that is thicker in depth than at an interior portion of the semiconductor layer thereby reducing electron beam emission at the outer perimeter wherein an electric field applied between the emitter electrode and the extractor electrode draws emission electrons from the surface of the planar electron emitter towards the extractor electrode at a higher rate at the interior portion than at the outer perimeter.

2. (original) The planar electron emitter device according to claim 1 further comprising a focusing electrode electrically coupled to the planar electron emitter.

3. (original) The planar electron emitter device according to claim 1 wherein the planar electron emitter has a generally concave top surface.

4. (original) The planar electron emitter device according to claim 1 wherein the planar electron emitter comprises a metal first layer and a semiconductor second layer deposited on the metal first layer.

5. (original) The planar electron emitter device according to claim 1 further comprising a dielectric placed between the emitter electrode and the extracting electrode.

6. (original) The planar electron emitter device according to claim 2 further comprising a second dielectric placed between the extracting electrode and the focusing electrode.

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7. (original) The planar electron emitter device according to claim 4 wherein the semiconductor second layer comprises a wide band-gap semiconductor.

8. (cancelled without prejudice.)

9. (cancelled without prejudice.)

10. (cancelled without prejudice.)

11. (cancelled without prejudice.)

12. (cancelled without prejudice.)

13. (cancelled without prejudice.)

14. (cancelled without prejudice.)

15. (cancelled without prejudice.)

16. (cancelled without prejudice.)

17. (cancelled without prejudice.)

18. (cancelled without prejudice.)

19. (cancelled without prejudice.)

20. (cancelled without prejudice.)

21. (cancelled without prejudice.)

22. (cancelled without prejudice.)

23. (original) A planar field emission electron emitter device, the field emission electron emitter device comprising:

an emitter electrode;

an extractor electrode; and

a planar electron emitter, electrically coupled to the emitter electrode and the extractor electrode to provide an electric field to draw emission electrons from the surface of the planar electron emitter wherein the planar electron emitter is configured to bias electron emission in a central region in preference to an outer region.

24. (original) The field emission electron emitter device according to claim 23 further comprising a focusing electrode electrically coupled to the planar electron emitter.

25. (original) The planar field emission electron emitter device according to claim 23 wherein the planar electron emitter has a generally concave top surface.

26. (original) The planar field emission electron emitter device according to claim 25 wherein the planar electron emitter comprises a metal first layer and a semiconductor second layer deposited on the metal first layer, the semiconductor second layer having a generally concaved top surface.

27. (original) The planar field emission electron emitter device according to claim 23 further comprising a dielectric placed between the emitter electrode and the extracting electrode.

28. (original) The planar field emission electron emitter device according to claim 24 further comprising a second dielectric placed between the extracting electrode and the focusing electrode.

29. (original) The planar field emission electron emitter device according to claim 26 wherein the semiconductor second layer comprises a wide band-gap semiconductor.

30. (cancelled without prejudice.)
